# MORPHEUS LT

# Workstation for

# gaseous anaesthesia

**code: OM3.A3**

**rev.: - dated 02/05/2011**

## INTENDED USE

The MORPHEUS LT is a workstation for gaseous anaesthesia and it can be used on adult, children and newborn patients.

The MORPHEUS LT is suitable for administration of Oxygen - Air -Nitrous Oxide - Halothane - Enflurane - Isoflurane - Sevoflurane - Desflurane mixtures.

## GENERAL DESCRIPTION

The unit for anaesthesia MORPHEUS LT is completed with:

- Mechanic gas mixing system
- Electronic lung ventilator with dual colour display
- Valves group: open, semi-closed, closed, heated, with soda lime absorber (0,5 Kg)
- SIARETEX rapid connection device, Selectatec compatible for 2 vaporizers
- Gas supply group

## TECHNICAL DATA

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| Structure | Light aluminium alloy and plastic moulds. |
| Wheels | Pivoting antistatic wheels, diameter 100 mm (2 with brakes) |
| Drawer | No. 3 full extension drawers |
| Cylinder support | No. 2 vertical cylinders supports, on the back side (for cylinders up to 10 litres capacity) and round rubber pads. |
| Support for 2 vaporizers | On horizontal guide (SIARETEX rapid connection device, Selectatec compatible for 2 vaporizers) |
| Auxiliary power supply outlets | No. 1 SCHUKO 220 Vac outlet (max. 6 A) |
| Work shelf lighting | 12Vdc by led |
| Dimensions | 71 x 77 x 138 (L x P x H) cm (without monitor). |
| Weight | 72 kg (without accessories) |
| Environmental conditions | • Temperature from 10 to 40°C<br>• Relative humidity from 10 to 90% non-condensing |

## GAS MIXING SYSTEM

General description

It has the function to regulate the capacity and the concentration of gas mixture (Air, $O_2$, $N_2O$) as well as to deliver it to the anaesthetic gas vaporizer.

It allows to select the mixture to be delivered (Air-$O_2$, or $N_2O$-$O_2$) and the $O_2$ enrichment for delivered mixture in case of emergency. The anaesthesia module includes a device which guarantees a minimum concentration of 25% oxygen in all conditions (MIX-LIFE device).

The three pressure gauges on the front panel allow the continuous control of medical gas feeding pressure coming from the gas pipelines system.

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| Oxygen rotameter | Scale: 0.2 - 12 l/min.<br>Resolution: 0.1 l/min up to 1 l/min and 0.5 l/min up to 12 l/min<br>Accuracy: ± 10% of read value or: ± 1% of end scale whichever is the worse case. |

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| Nitrous oxide rotameter | Scale : 0.2 - 12 l/min.<br>Resolution: 0.1 l/min up to 1 l/min and 0.5 l/min up to 12 l/min<br>Accuracy: ± 10% of read value or: ± 1% of end scale whichever is the worse case. |
| Air rotameter | Scale: 0.2 - 12 l/min.<br>Resolution: 0.1 l/min up to 1 l/min and 0.5 l/min up to 12 l/min<br>Accuracy: ± 10% of read value or: ± 1% of end scale whichever is the worse case. |
| Medical gas supply | OXYGEN<br>• Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)<br>• Max. required flow 90 l/min. |
| | NITROUS OXIDE<br>• Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)<br>• Max. required flow 15 l/min. |
| | MEDICAL COMPRESSED AIR<br>• Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)<br>• Max. required flow 90 l/min. |
| Gauges | No. 3 on front panel ($O_2$ - $N_2O$ - AIR ), scale 0 - 10 bar |
| Alarms | Lack or low oxygen pressure with consequent cut-off of nitrous oxide delivery |
| Safety devices | AGAINST THE ADMINISTRATION OF HYPOXIC MIXTURES<br>• MIX-LIFE: it always guarantees a minimum concentration of 25 % oxygen on mixtures which includes nitrous oxide.<br><br>IN CASE OF LACK OR LOW OXYGEN PRESSURE<br>• CUT-OFF: audible alarm with immediate cut-off of nitrous oxide delivery.<br><br>AGAINST HIGH PRESSURE IN SUPPLY<br>• Safety valve calibrated at 0.8 bar.<br><br>IN CASE OF LACK OR COMPRESSED AIR LOW PRESSURE<br>• All the devices (gas feeding) supplied by compressed air are automatically supplied by oxygen.<br><br>AGAINST THE SIMULTANEOUS DELIVERY OF AIR AND $N_2O$<br>• Selector button on the flowmeter front panel. |

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| Control for activation of exit of fresh gas for manual ventilations. | Setting of manual modality on ventilator with automatic deviation of fresh gas to the manual system of anaesthesia unit valves group, or to a to-and-fro circuit with visual indicator.<br>Automatic deactivation of manual ventilation systems directly by ventilator control. |
| $O_2$ emergency by-pass | By push button, max flow 35 l/min. |
| IN gas sockets on gas supply group | • No. 3 sockets for distribution system ($O_2$ - $N_2O$ - AIR)<br>• No. 2 sockets for cylinder ($O_2$ - $N_2O$) |
| OUT gas sockets on gas supply group | • No. 1 sockets for $O_2$<br>• No. 1 sockets $O_2$ - AIR for active scavenger feeding<br>• No. 1 fresh gas connector for external use for ex. TO AND FRO (selectable by apposite membrane key on the front shelf). |
| Other | • Socket for recycle of exhaust monitor gas<br>• Connection for anaesthetic gas scavenging (optional device: active type, or passive type) |

## BREATHING SYSTEM

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| General description | Compact system with automatic connections, easy dismountable and autoclavable |
| | It allows the ventilation in modality: real open circuit, semi-closed circuit, closed circuit at low flows.<br><br>The system also allows the spontaneous and manual ventilation in case of machine breakdown or machine off.<br><br>The $CO_2$ absorber canister ISI PAC of 0,5 Kg whose rapid disconnection system allows its replacement also during operation.<br><br>The recycling system is a selective type, hence the soda lime and fresh gas consumption are reduced to the minimum.<br><br>The heated circuit reduces the condensation and heats the fresh gas.<br><br>The transition from one modality to another is completely controlled by the ventilator without any user's action on valves group. |

## LUNG VENTILATOR

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| User's interface | Dual colour display 165 x 145 mm with membrane keyboard and encoder |
| Control modality | Electronic by microprocessor |
| Dead space compensation system | Automatic |
| Flow generation | Electronic system |
| Gas feeding | Medical compressed air or Oxygen with pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)<br><br>**Option:** Turbine for gas feeding independent from gas pipelines system. |

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| Autotest | **Primary test:** At device's start-up, a control test of medical gas supply, sensors operation, patient circuit losses, back-up battery, oxygen cell, integrity of the alarm audible indicator. This test takes around 15 seconds.<br><br>**Subtest:** This subtest permits to verify the dead space and losses or to perform the oxygen cell calibration. |
| Ventilation modalities | MANUAL, VC-VAC, PCV-APCV |
| Breathing rate | From 5 to 99 bpm |
| I:E Ratio | 1:4 ÷ 4:1 |
| Inspiratory time | From 0,2 to 5 sec. |
| Inspiratory Pause | From 0 to 60% of inspiratory time |
| SIMV rate | From 0 to 98 bpm |
| Tidal Volume | From 10 to 1500 ml |
| Minute Volume | From 1 to 30 liters |
| PEEP | OFF, 3 ÷ 30 $cmH_2O$ |
| Inspiratory Flow | From 1 to 80 liters/min. |
| Oximeter | Minimum resolution 1% / Automatic calibration procedure |
| Bronchomanometer | -20 ÷ 80 $cmH_2O$ |
| Flow trigger | From 1 to 9lt/min |
| Pressure trigger | From –1 to –9 $cmH_2O$ under the PEEP level |
| Safety | Electronic and mechanical limit of airways pressure/ Self-diagnosis system |
| **Breathing Monitor** | **M3000D optional (*) – [see relevant technical data sheet]** |
| Flow sensor - **optional (*)** | Internal to the group, by magnetic perturbance, reusable. |
| Alarms | O2 concentration, Low / High airways pressure, Apnoea, disconnected patient circuit, Low battery, Electric power supply, Medical Gases. |
| Alarms - **optional (*)** | Pmax, Pmean, Ppause, PEEP, Vti, Vte, ExpMV, Rate, Cs, Ri . |
| Measured parameters | PAW, PEEP, Pmean, Rate, Pause, VM, Tinsp, FiO2 |
| Measured parameters **- optional (*)** | Pmax, Pmean, Pause, PEEP, Vti, Vte, ExpMV, Rate, FLOWi, FLOWe, I:E, Tinsp, Tesp, Tpause, Cs, Ri |

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| Ventilation curves - **optional (*)** | CURVES: Pressure - Flow - Volume<br>LOOPs: Volume / Pressure and Flow / Volume<br>Measurement RANGE: automatic |
| Trend - **optional (*)** | Scale and time setting (30 or 60 minutes)<br>Trends: Pmax; Pmean; Ppause; PEEP; Vti; Vte; ExpMV; Rate; FLOWi |
| Configuration and gas type selection - **optional (*)** | **THIS FUCTION CAN BE AVAILABLE ON M300D breathing monitor**<br>• Analysis software of $CO_2$, $O_2$, $N_2O$, AG automatic identification<br>• Mainstream external device<br>• Sidestream integrated device |
| Configuration and gas type selection<br>**(optional)** | **THIS FUCTION CAN BE AVAILABLE ON NEPTUNE 12" – 15 " MONITORS**<br>• Software for analysis of $CO_2$, $O_2$, $N_2O$, AG automatic identification, MAC (based on weight).<br>• Mainstream external device<br>• Sidestream built-in device |

## ELECTRIC POWER SUPPLY

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| Electric power supply | 100 ÷ 240Vac / 45 ÷ 60Hz |
| Maximum power | 100 Watt |
| Back-up battery | 12Vdc - 3 Ah pb battery which guarantees an autonomy of around 120 minutes |
| Charging time | Around 10 hours |

## CONFORMITY TO DIRECTIVES

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| Class and type according with IEC 601-1 | Class I Type B |
| Class according with 93/42/CEE | Class IIb |
| IEC 601-1, IEC 601-1-1, IEC 601-1-2, IEC 601-1-4, EN 1281-1, UNI EN 740, UNI EN ISO 9703-3, EN 4135, 93/42/EEC DIR. | |

## ACCESSORIES

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| **Standard accessories** | • User's Manual<br>• $O_2$ supply hose<br>• $N_2O$ supply hose<br>• Air supply hose<br>• $O_2$ cylinder supply hose<br>• $N_2O$ cylinder supply hose<br>• IS PAC box of 0,5 kg. (10 pcs.)<br>• $O_2$ cell<br>• Adult silicone patient circuit<br>• Adult Mapleson C adult patient circuit<br>• Manual ventilation KIT<br>• SHUKO-VDE electric power supply cable |
| **Other optional accessories** | See current export price list |

SIARE applies the UNI EN ISO 13485:2004 Quality System and 93/42 EEC Dir.ve.

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